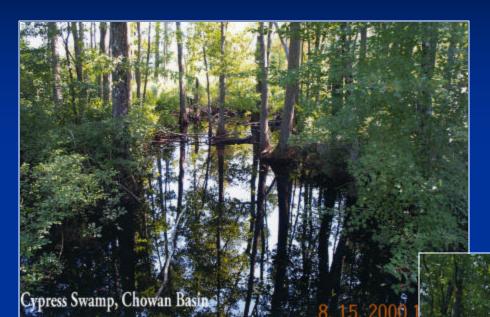
### Class VII Swamp Waters Background

- Began as an effort to address naturally low DO & pH in swamps/blackwater streams & rivers
- Characterized by:
  - Low flows Minimal re-aeration large quantity of decaying vegetation → high concentrations of organic acids (tannins, humic & fulvic substances)

#### Background cont'd

- Proposed amendments Class VII (Swamp Waters) w/ pH criteria 4.3 9.0 and simultaneously presented candidate waters in southeast Va. within the Chowan drainage for Class VII
- Proposed pH range of 4.3 9.0 based on journal literature & review of other states' w/ similar category
- Class VII pH criteria became effective 2004
  - Applies to 9 waters w/i Chowan basin
  - Currently no numerical DO criteria for Swamp Waters. Only narrative criteria.
  - VPDES permits must still have pH limit 6.0 -9.0
- Methodology for justifying reclassification of a water body to Class VII formalized in 2004
  - Adapted from Maptech, Methodology for Assessing Natural Dissolved Oxygen and pH Impairments: Application to the Appomattox River Watershed, Virginia. 2003.

### Class VII Swamp Waters Existing Examples



Blackwater River@Rt. 617, Chowan Basin

### Class VII Swamp Waters Amendments Under Consideration

- Methodology was used to develop list of waters that may justify additional Class VII waters in the following DEQ regions:
  - PRO 14 waters
  - TRO 4 waters
  - NRO 2 waters
  - pH criteria may need updates (i.e. lower end of the range may not be low enough. Example Lake Drummond mean pH range 3.8 4.3).
  - May be necessary to provide for numerical DO criteria

# Class VII Swamp Waters Dissolved Oxygen Criteria

- Naturally low DO, cause of many impairments in current and future Class VII waters
- DO minima highly variable (zero 3.99)
- Variable within swamp, depth, season and year
- 166 potential sites
- Site specific most protective but difficult

## Class VII Swamp Waters Interesting Fact

A joint VCU/DEQ study found that study sites within old growth blackwater system watersheds showed the greatest pH depressions and study sites within deforested and agricultural watersheds exhibited less severe pH depressions

